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## REVIEWS

Fourth Biennial Report of the State Geological Survey of North Dakota. By A. G. Leonard, State Geologist, E. J. Babcock, and C. H. Clapp. 312 pp., 37 pls., map. Grand Forks, 1906.

This volume continues the systematic descriptions of the economic possibilities of the state which have been published in previous years. North Dakota possesses extensive deposits of high-grade clays, as was well shown in the exhibits of the School of Mines at the St. Louis and Portland Expositions. The report contains chapters on the origin, chemistry, value, and physical properties of clays in general, and on the stratigraphy and economic geology of North Dakota clays in particular, together with a description of the methods of mining and manufacture now employed. H. H.

The Production of Gold and Silver in 1906. By Waldemar Lindgren, and Others. Advance chapter from Mineral Resources for 1906. U. S. Geol. Surv. 265 pp. Washington, 1907.

The total of these two metals mined in the United States, amounting in value to \$132,630,200, showed an increase of over \$10,000,000 for the year. Colorado, Alaska, and California were the chief producers of gold, and Montana, Colorado, and Utah of silver.

H. H.

Iowa Geological Survey. Vol. XVII. Annual Report for 1906. 588 pp., 62 pls., 44 figs. Des Moines, 1907.

The major portion of this volume consists of a description of the quarry products of Iowa. Special stress is laid on cements and cement materials, and the careful general treatment of the properties, uses, and preparation of different grades of cement will be found valuable by economic geologists, and those commercially interested, in all parts of the country. H. H.

The Grenville-Hastings Unconformity. By WILLET G. MILLER AND CYRIL W. KNIGHT. An extract from the Sixteenth Report of the Ontario Bureau of Mines, 1907. Part I, pp. 221-23.

The authors find themselves unable to agree with certain of the conclusions of the International Committee of 1906 in regard to southeastern 582 REVIEWS

Ontario and the neighboring portions of Quebec. They object especially to the statement that the Hastings series is in reality only a less altered phase of the Grenville series. They have found that in eastern Ontario many of the limestones, conglomerates, and other fragmental rocks, which have been called the Hastings series, are much younger than the typical limestones of the Grenville series proper, and overlie the latter unconformably. The Grenville limestone, which rests in places on the ropy surfaces of Keewatin lavas, may be correlated with the Keewatin Iron Formation of the Lake Superior region; while the younger sedimentaries of the Hastings series are probably Huronian in age.

H. H.

The Pre-Cambrian Volcanic and Intrusive Rocks of the Fox River Valley, Wisconsin. By William Herbert Hobbs and Charles Kenneth Leith. Bulletin of the University of Wisconsin, No. 158, pp. 247–78. 21 figs. Madison, May, 1907.

The Fox River Valley area of south-central Wisconsin presents several well-defined exposures of crystalline rocks of quite uniform chemical and mineralogical composition, but of varying textures. In passing outward from the granitic centers, intermediate textures and then surface volcanics are encountered, indicating the truncation of a volcanic region. The age of these rocks is certainly pre-Cambrian and probably Archean; for they occur as monadnocks projecting above the pre-Cambrian peneplain. The various rock types which are found in the area are fully described in the report.

H. H.

Abandoned Shore Lines of Eastern Wisconsin. By James Walter Goldthwait. Wisconsin Geological and Natural History Survey, Bulletin No. XVII. 126 pp., 37 pls., 37 figs. Madison, 1907.

While the history of the greater Great Lakes which existed during the late stages of the Glacial period has been well blocked out by various investigators, detailed study of the ancient shore lines has been undertaken in only a few areas. This bulletin contains a very complete description of the old shore lines in Wisconsin, together with a review of all the previous work done in developing the history of the lakes, and a useful bibliography. Light is thrown on several controverted questions, and among the more important conclusions reached may be mentioned the following:

The 60-foot and 40-foot beaches of Lake Chicago seem to extend as far north as Sheboygan. It seems probable that the more northerly portions of them were